eNtsa NEWS

Nelson Mandela Metropolitan University
for tomorrow
Port Elizabeth & George

"INNOVATION THROUGH ENGINEERING"

INSIDE THIS ISSUE

Meet the eNtsa team

The eNtsa team at Motive Tooling with the GRW platform on which a 8m weld was successfully completed. (see page more on the Longest weld attempt.)

Caption of picture above:

1st Row: **Mr Ian Wedderburn** (Senior Design Engineer), **Mr Dreyer Bernard** (Intern), **Mr Riaan Brown** (Research Engineer), **Mr Etienne Phillips** (Systems Engineer), **Mr Dirk Odendaal** (Senior Project Manager), **Mr Willem Pentz** (Intern), **Mr Maien Hamed** (Systems Engineer) and **Mr Donnie Erasmus** (Design Engineer)

2nd Row: **Prof Danie Hattingh** (Director), **Mr Louis von Wielligh** (Senior Process Engineer), **Prof Annelize Els-Botes** (Metallurgist Advisor), **Mrs Lucinda Lindsay** (Operations Manager), **Mrs Natalie Xoli** (Administrative Assistant), **Ms Nadine Marupen** (Research and Marketing Assistant), **Ms Thandile Ndevu** (Intern)

3rd Row: **Darren Samuel** (Intern), **Andrew Young** (Deputy Director), **Stephen Grewar** (Design Engineer), **Madindwa Mashinini** (Intern), **Jaromir Cizek** (Manufacturing Technician), **Daniel Bulbring** (Intern), **Julien de Klerk** (Systems Engineer)

Absent: Mr William Rall (Mechanical Lecturer)

Word from the Editor

The eNtsa newsletter is one of the marketing endeavours that allows eNtsa members and various stakeholders to receive a glimpse of our success, achievements and professional passions.

The first edition of the newsletter highlights the history and developments of eNtsa over the past.

eNtsa and its heritage is filled with fond memories, great milestones and promising prospects. Thus far, 2011 has been filled with pronounced excitement, many new opportunities and challenges.

It is with immense enthusiasm and excitement that I wish to welcome the readers to share our joutney.

Happy reading!

Nadine J. Marupen
eNtsa - Marketing & Research Assistant.

From ACTS to eNtsa

In the beginning…

eNtsa (formerly known as Automotive Components Technology Station - ACTS) was established in May 2002 at, the old Port Elizabeth Technikon today known as, the Nelson Mandela Metropolitan University's Summerstrand Campus (North).

Professor Danie Hattingh, current Director, was one of the original members of eNtsa. Professor Hattingh was an active individual consultant who over his career developed networking linkages within industry. At the time eNtsa employed two masters students, both of whom also had some years' experience working in industry, before taking up research positions.

The programme at eNtsa began to take shape and over the past nine years the unit experienced rapid growth, a merger, recession, diversification and the integration into the Technology Innovation Agency.

All these challenges had a constructive effect on the eNtsa as it made the dynamics within the group more diverse and innovative. eNtsa (then ACTS) was rated the best Technology Station, twice, by independent auditors and classed as 'world class' according to an international benchmark exercise.

> ***"prime focus of eNtsa remains to ensure that it stays at the forefront of technology"***

The unit has been doing incredibly exciting work during the past financial year and there are also a number of commercial projects in the pipeline. eNtsa has established itself as a strategic partner to industry and have successfully delivered multi million rand projects to the power generation and transport industry.

In order for the unit to ensure that it maintains current clients, and assist new clients, various strategic planning sessions were held during 2010 to prepare for the changing environment. It was clear from these sessions that due to the current nature of projects the unit no longer be referred to as the 'Automotive Components Technology Station'.

eNtsa – Name, vision & mission

What the unit is today developed systematically over time. After careful consideration, it was decided to change the unit's name to support the vision of focusing on innovation through engineering.

From 01 October 2011 the Technology Station was renamed 'eNtsa'. The new name 'eNtsa' was derived from one of the African languages' word: 'eNtsha' meaning new.

The prime focus of the eNtsa remains to ensure that it stays at the forefront of technology innovation.

The vision of eNtsa is: '*To be the preferred strategic partner for technology innovation and commercialization to the benefit of the South African industry*'

The mission of eNtsa is: *to enhance the South African industry's global competitiveness through the following:*

- *Assist and create new opportunities for the South African industry through commercialization;*
- *Technology advancement through research and development;*
- *Leveraging local and international partnership in order to facilitate technology transfer;*
- *To facilitate knowledge generation and transfer to build local technological competencies; and*
- *Building a culture of innovation within the broader engineering community.*

Governance and Management

eNtsa is governed by a panel of board members that consist out of 14 external and internal NMMU members. Furthermore eNtsa's management committee consists out of the 6 line managers of the group. Both the Board and Management committees meet on a frequent basis to steer towards the vision of eNtsa.

Exciting ventures for the group

The eNtsa group has developed specialized skills in the field of design, automation and manufacturing. Combining this advance engineering capacity with the Friction Processing research done assisted the team to test new boundaries with regard to platform, process development and technology transfer relating to friction processing solutions for industry.

WeldCore™ - award winning process

In August 2010 the team was awarded the National Innovation Competition's first prize for the friction processing technique, trademarked by the group as WeldCore™. (see Eskom article on the next page for more on WeldCore™)

Furthermore WeldCore™ has led to the development of a spin-off\ company known as Mantacor. The company is in its developmental stage but is expected to expand in the near future by addressing the needs of industry within the local and international community.

Mantacor is aimed at encouraging research , technology transfer and innovation, to serve as custodian to develop a solid network of trust within industry by illustrating the ability to timeously deliver large scale engineering projects.

To date eNtsa consists of 23 staff ranging from engineers, academics and office professionals. The expertise, knowledge and infrastructure available, within eNtsa and the NMMU, enables the capability of taking on a variety of engineering related projects. In addition to these capabilities the projects and team supports the development of postgraduate students by offering research students first hand research development experience and industrial interaction.

eNtsa - *The new look*

With progressive developments within and around eNtsa, the look of the unit has changed.

The new exciting era of the unit has led to the creation of a logo, aimed to strengthen the brand of professionalism, high-skill and service delivery the team has to offer.

The brand is in its infant stages but is being developed with a strategic and fully envisaged goal.

Caption of images: Below is the 2002 ACTS logo and the newly designed eNtsa logo of 2011.

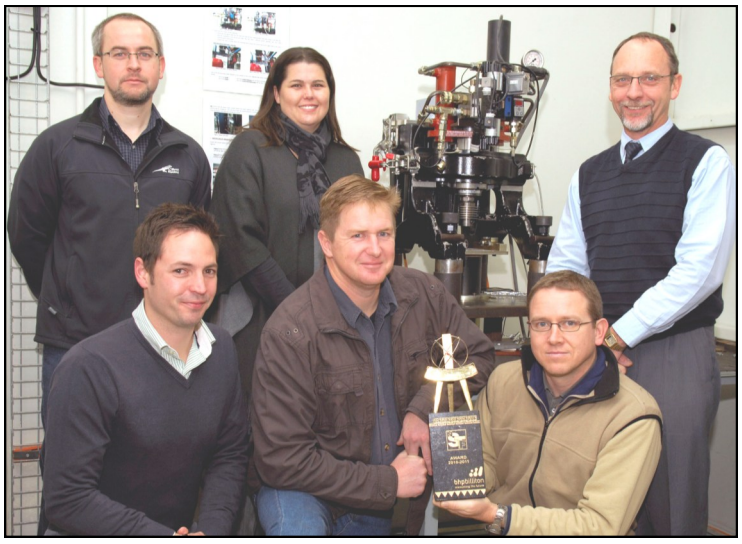
2002

SHUMISANO
PARTNERSHIP IN TECHNOLOGY
Automotive Components Technology Station
ACTS - est. 2002

2011

eNtsa
innovation through engineering

NSTF Awards - 2011: *NMMU's Research innovators*



eNtsa Management with the 2010 - 2011 NSTF award for Research leading to an Innovation for the WeldCore™ process.

From left to right – First row: **Dirk Odendaal** (Senior Project Manager); **Andrew Young** (Deputy Director); **Ian Wedderburn** (Senior Design Manager); back row: **Louis Von Wielligh** (Senior Process Manager); **Lucinda Lindsay** (Operations Manager); **Prof Danie G. Hattingh** (Director).

The eNtsa team won this year's National Science and Technology Forum (NSTF) Awards for "Research leading to an innovation by a team" for the WeldCore™ process. This award category is for individuals/teams that have made outstanding contributions to science, engineering and technology through research that has led to an innovation in South Africa.

The purpose of the NSTF awards are to:

- Achieve sustainable economic growth for South Africa;
- Improve the quality of life of its people;
- Promote excellence among Science and Engineering and Technology and Innovation (SETI) practitioners, research development, and innovation and;
- Encourage young people to undertake careers in SETI.

This initiative is intended to identify and commemorate individuals and organisations for exceptional contribution in SETI. The awards were presented by the Minister of Science and Technology, Ms Naledi Pandor, and The Department of Science and Technology. The Gala Event took place 26 May 2011 at the Emperor's Palace in Johannesburg.

For more information on awards won by the group, kindly email : Nadine.Marupen@nmmu.ac.za

R11m Industrial contract
An Eskom collaboration

During May 2011, eNtsa and an Engineering team from Eskom finalized the details for implementation of an R11million research contract. This contract, one of the largest research contracts awarded to the NMMU, is in support of late stage research and development for the finalization and commercialization of the coring and friction process repair technique, trade marked by the NMMU as WeldCore™.

In addition to the National Science and Technology Forum (NSTF) Awards, the WeldCore™ phenomenon was awarded the National Innovation Competition's first prize, making it a two time award winning process. The project is known for its value proposition as a process developed with the aim of assisting with decision making around remnant life prediction of engineering structures in industry.

The process additionally relates to reducing the risk of unexpected catastrophic failure and reduction of plant downtime which contributes to substantial cost savings.

Starting in 2011, the contract will reach its maturity within three years. The eNtsa team, in accordance with Eskom, is committed to the design and assembly of equipment that will develop and certify the WeldCore™ process. This business venture will additionally support the development of BTech, Masters and Doctoral Mechanical students and the enhancement of skills within the NMMU academic community.

Caption of the picture: From left to right: Mr Mark Newby (Eskom: Senior Consultant – Stress analysis); Mr Phillip Doubell (Chief Welding Engineer); Prof Henk De Jager (Executive Dean: Faculty of Engineering, the Built Environment and Information Technology) and Prof Danie G. Hattingh (Director of eNtsa).

Technology Innovation Agency (TIA)

Know the Basics

The Technology Innovation Agency is a public entity aimed at stimulating and intensifying innovation and inventions in order to improve the economic growth of South Africa. Consequently TIA's efforts envisage to enhance the quality of life for all South Africans by: developing and exploiting technological innovations and interventions; and creating an enabling environment wherein commercialisation can take place.

> *"stimulating and intensifying innovation and inventions in order to improve the economic growth of South Africa"*

TIA's Board consists of twelve members that are responsible for the governance and strategic direction of the unit in order to achieve TIA's objectives. Mr Simphiwe Duma is the appointed Chief Executive Officer who assumed his position 01 September 2010.

TIA, a public entity, is expected to stimulate the development of technology based products and services. This stimulant is focused on the public and private sector technology based enterprises, thereby, developing a significant technology base for the country's economy.

eNtsa provides various services that can be branched in to four main streams. These main streams are listed as: Financial; Non-Financial; Human Capital Development and; Manufacturing and Technology Strategies. Within these streams of services TIA provides support to Technology Stations within South Africa in effort to reach respective Technology Station objectives and TIA's objectives. These aims more broadly include the development of innovation and technology transfer and enhancement of the economic growth for South Africa. eNtsa therefore operates as a Technology Station of TIA.

The TIA Brand has been under construction. The new TIA Corporate Manual is expected to be distribute in the near future.

For more information on the Technology Innovation Agency, visit www.tia.org.za

technology innovation AGENCY

Mantacor - Spin-off company

The commercialisation link

The award-winning WeldCore™ process has led to the development of a spin-off company, known as Mantacor. The company is in its developmental stage but is expected to expand in the near future by addressing the needs of industry within the local and international community.

Mantacor is aimed at encouraging research, technology transfer and Innovation and serve as custodian to develop a solid network of trust within industry by illustration the ability to timeously deliver large scale projects.

Welcome to Mr Colin Schroder, newly appointed as Mantacor's business driver.

Logo below:
Mantacor's logo that will be used on all stationary, branding and marketing material.

MANTACOR

BRIEFS
WORKSHOPS AND TRAINING

02 - 03 February - Metallurgy Workshop presented by Prof. Dr. -Ing. Dennis Twigg

Professor Dennis Twigg is an international consultant in metal failure analysis and corrosion technology with over 40 years of experience. This workshop has been prepared by Prof Twigg for South African Engineers and related personnel involved with ferrous and non-ferrous metals and their alloys. (see page 8 for workshop opportunity)

11 & February 2011 - NMMU Safety Induction

All staff and students are obliged to attend a Safety Induction to inform them on the safety and caution procedures set in place at the NMMU. eNtsa and School of Engineering members attended these induction sessions presented by Mr Mervin Knoesen (Safety Officer & Senior Laboratory Technician, Department of Mechanical Engineering).

18 – 21 April - Publication Writing workshop presented by Prof. Neil James

This workshop was aimed at researchers who are novice authors and who aim to published articles in accredited journals. During this workshop attendees received guidance on writing an article based on the outcomes of their research. This workshop was presented by the esteemed Profession Neil James from the University of Plymouth.

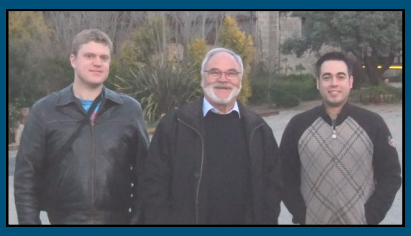
Above picture: ***Prof James*** (sitting) with attendees of the Publication writing workshop.

20 June 2011 - Laser Safety training presented by National Laser Centre

The National Laser Centre (NLC) presented a workshop on Laser Safety. The workshop as presented by Aletta Karsten (Biophotonics, NLC) to NMMU staff and students.

4 - 6 July - 3 Day workshop presented by Prof. Dr. -Ing. Lothar Issler

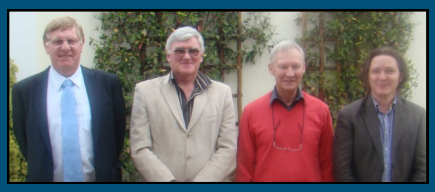
eNtsa hosted a workshop on Failure investigation and Prevention Design Concepts for Engineering Structures. This workshop was held in Worcester and presented by Prof Issler.



Picture above: ***Prof L Issler*** (centre) with engineering students: ***Darren Samuel*** (left) and ***Willem Pentz*** (right) during the proceedings of the Workshop in Worcester.

31 August - 01 September 2011 - International Friction Processing Seminar and Workshop

The NMMU hosted **this seminar** aimed at providing researchers and engineers an opportunity to review the current status of available Friction Processes. To conclude the seminar the **Workshop *for industry*** was held to discuss the strategic direction of Friction Processing research in South Africa.



Keynote speakers and international guests included: ***Dr W Thomas***, ***Dr T Paterson***, ***Prof MN James***, ***Dr D Asquith*** (above picture) and Mr L Darby. Industrial attendees included members from Eskom and the Aluminium Federation of Southern Africa.

13 - 14 October - Heat Treatment Workshop presented by Prof. Dr. -Ing. Dennis Twigg

This course has been prepared by Professor Denis Twigg for South African engineers and related personnel involved with ferrous and non-ferrous metals and their alloys. The emphasis is on the applied side of metallurgical technology and will therefore be of value to a wide range of delegates from differing metallurgical backgrounds.

For more information on the above seminar and workshop, visit www.nmmu.ac.za/fpri/ifps

An Industrial project milestone

The GRW Project

GRW is famous as South Africa's biggest and trusted provider of high-quality road tankers. The GRW team builds and repairs tankers and are well-known amoung transport companies in Southern Africa and the United Kingdom.

The company was developed by a family group that started with a small idea and resulted in a well pursued towards their dream which has led to great success. The GRW family prides themselves in being the industry's undisputed leader in engineering and service excellence.

"Through their unfailing commitment to impeccable quality and customer care, GRW continues to build their legacy as a supplier of road tankers that proud of and our customers can trust." *(GRW website, 2011)*

eNtsa has been contracted to design and construct a structure for the GRW group aimed to optimize the production and increase quality of currently manufactured structures.

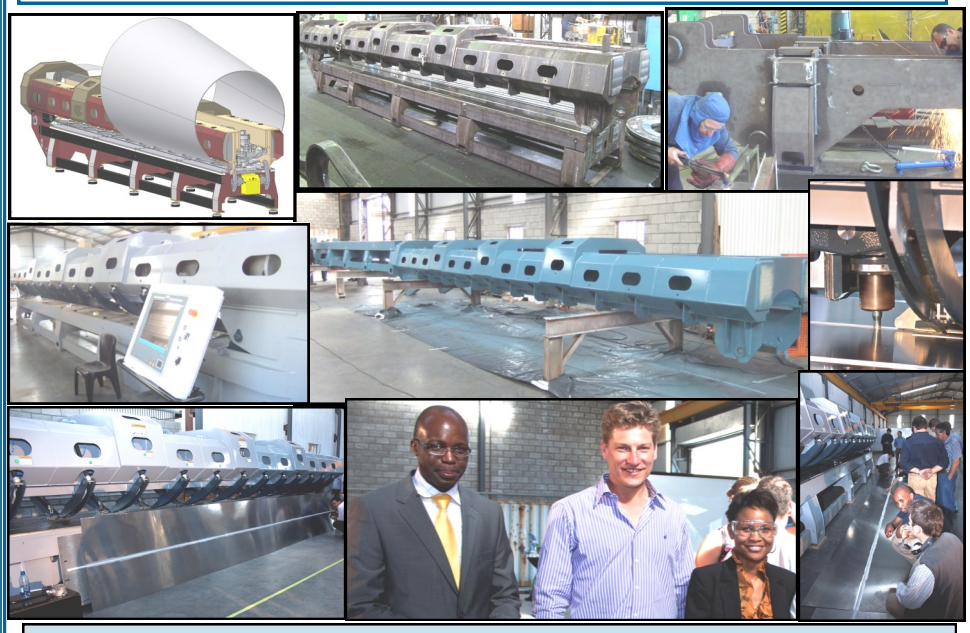
The GRW project has been categorized into various phases to benchmark the progress of the project. Initial conversation started October 2009 and has developed over the past two years. Currently the structure is in the final stretch of phase three assembly and is envisage to be commissioned within 2011.

eNtsa attempted the longest weld in Africa using the Friction Stir Welding technique. This event took place 06 October 2011, 15:00 at the Motive Tooling warehouse. The weld, eight meters (8m) long using five millimeter (5mm) aluminium plates, was completed on the newly developed platform by the NMMU for GRW.

The success of the longest welding attempt event will be the stepping stone to transfer the technology for South Africa and the first commercial roll-out of Friction Stir Welding for Africa.

eNtsa researchers and the GRW team has established a solid professional relationship with promising prospective endeavours for the future.

For more information with regard to GRW project, email eNtsa@nmmu.ac.za



Caption of pictures:
These pictures capture some of the developments of the GRW phase 3 project and longest weld demonstration that took place 06 October 2011.

Above centre picture: Special guest that attending the weld demonstration included: Mr S Duma (TIA CEO), Mr G Wentzel (GRW - CFO), Mrs Z Ngceka (TIA Business Driver).

Thank you to the team for all their effort and the broader NMMU community for the continuous support!

Striving towards increased optimised service delivery

eNtsa, has recently become an Ethernet Control Automation Technology (EtherCAT) Technology Group Member (ETG).

Ethernet, associated with local area networks (LAN), is defined as a family of frame-based computer networking technology. This technology has been commercially available since around 1980, largely replacing competing wired LAN standards. (http://en.wikipedia.org/wiki/Ethernet)

EtherCAT is a fast growing open technology that allocates new standards for real-time outputs and positioning flexibility. High precision device synchronization, cable redundancy options, and a functional safety protocol are the main features of this technology. Furthermore EtherCAT is a recognised international standard which can be implemented very cost effectively as the system enables field busses to be used in applications where field bus networking could not be used before.

ETG members rank from various industries. More prominent members of ETG include, Panasonic, Samsung, LG Innotek and Beckhoff Automation. EtherCAT is also a trademark of Beckhoff Automation Technologies.

As member of the this group, the eNtsa team will obtain access to EtherCAT specifications, guidelines, sample code, evaluation kits and other supportive tools and information. This will enable the eNtsa group to increase optimise service delivery to existing and prospective clients.

Furthermore, ETG members are:

- invited to ETG meetings where specs are reviewed and discussed;
- allowed to take part in dedicated EtherCAT training classes and workshops;
- granted the opportunity to promote their products on the EtherCAT website and on exhibit at mayor worldwide trade shows.

It is with great excitement that the eNtsa team looks forward to explore this new opportunity.

EtherCAT high speed communication technology is extensively used in eNtsa real-time friction processing platforms.

Membership to the EtherCAT technology group will allow the eNtsa team to develop proprietary systems that can interface directly with other EtherCAT enabled devices. The goal is to increase flexibility of future solutions.

For more information on EtherCAT, visit www.ethercat.org *

EtherCAT® Technology Group

National Science week supported initiative

Loyiso High School visit to eNtsa

The National Science week 2011 took place from 02 – 07 August. This week aims to contribute to science, engineering and technology amoung various sections of the nation. This week is celebrated annually and is intended to expose the public, educators and learners to science-based careers, particularly to disadvantaged sections of the population.

In support of National Science week, the eNtsa and the Technology Innovation Agency hosted 18 scholars, grade 10 to grade 12, from Loyiso High School. The visit exposed these students (predominantly mathematics and science students) to the technology station and possible career paths they can follow within the field of engineering.

Scholars were informed of engineering courses offered at the NMMU, mainly within the field of Engineering. NMMU students' projects (Mini-Baja 2011, solar car, etc.) were displayed and illustrated to the young group of scholars. These scholars had the opportunity to talk to engineers at the eNtsa and partake in a "hands-on" session in the metallurgy laboratories.

Thank you to TIA for this great initiative and all eNtsa members and mechanical engineering staff for making this school visit an enlightening experience for the students of Loyiso High School.

Picture above: Dirk Odendaal (eNtsa) informs the Loyiso students about what eNtsa engineers do.

Bottom picture: **The Loyiso High School Group** (Grade 10, 11 and 12 students) with Technology Innovation Agency representative, Zoleka Ngcete (back left).

Left picture : The students visiting the Metallurgy lab and having a look at cast iron through the microscope.

Memorable moments Prestigious firsts

Caption of top picture:
Masters students, Grant Kruger and Calvin Blignault holding the **first Friction Stir Weld** on 6mm thick aluminium alloy plate made in South Africa at the old Technikon, with promoters, Prof Danie Hattingh and Prof Theo Van Niekerk.

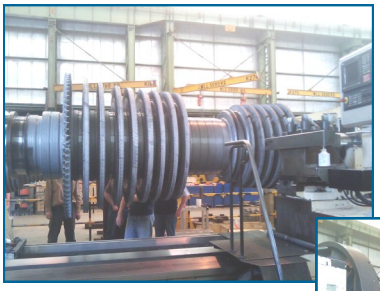
Caption of top centre picture:
First female DTech in Mechanical Engineering at NMMU – Professor A Els-Botes

Caption of top picture:
WeldCore™ – Friction stir welding process, practiced and by the NMMU eNtsa group has received national recognition when awarded the **first price** at the National Innovation Competition in 2010 (above picture) and the NSTF awards. From left is Dr Mamphela Ramphele (Chairperson of the board of the Technology Innovation Agency), Mr Dirk Odendaal (Senior Project Manager – eNtsa), Darren Samuel (eNtsa), Daniel Bulbring (eNtsa) and Dr Phil Mjwara (Director-General, Department of Science and Technology)

Caption of bottom right picture:
First final commissioning of the R6.5million MTS-ISTIR friction stir welding research platform. Making the **first Titanium friction stir welds in South Africa** and with this research the group has joint an elite group of researchers in the world capable of achieving this. Postgraduate student Madindwa Mashinini with the **first Titanium friction stir weld.**

Caption of bottom left picture

On Saturday, 3 September 2011, a team of engineers from eNtsa **successfully implemented the 1st commercial application related to the patented WeldCore™ technology,** jointly developed by NMMU and Eskom. This was done at the Rotek facilities in Johannesburg on a component with a R1.2billion replacement value.
The application included the removal of a core sample and repair of the removal site by a Friction Taper Hydro Pillar Processing platform developed specifically for this application at eNtsa.
The cylindrical core sample removed from the turbine rotor disk allowed Eskom engineers to accurately determine sub surface creep damage. This Information provided adequate scientific evidence to create confidence in extending the service life of the current structure. This consequently now will lead to the postponement of capital expenditure *and result in a major cost saving* for Eskom.
This momentous event is the result of hard-work and research, co-developed by eNtsa and Eskom, over the past 8 years.



VC visits the Faculty
Visit to eNtsa

On 7 November 2011 NMMU's Vice Chancellor, Professor Derrick Swartz, visited the Faculty of Engineering, the Built Environment and Information Technology. The visit included guided tours of the faculty's laboratories and research entities.

The eNtsa team met Prof Swartz during his visit to the eNtsa equipment laboratory and offices.

Discussion held with the VC included information of mayor industrial projects as well as the involvement and importance of post graduate students within the field of research at eNtsa.

eNtsa would like to thank the Vice-Chancellor, Prof Swartz, the Executive Dean of the Faculty, Prof De Jager, the Faculty Management Committee members and the extended NMMU research and academic community for their continuous support.

VC meets eNtsa members: right picture - from left to right: **Mr Maien Hamed** (Systems Engineer), **Prof Derrick Swartz** (NMMU VC), **Mr Dirk Odendaal** (Senior Project Manager) and **Mr Etienne Phillips** (Systems Engineer)

The Friction Processing Research Institute

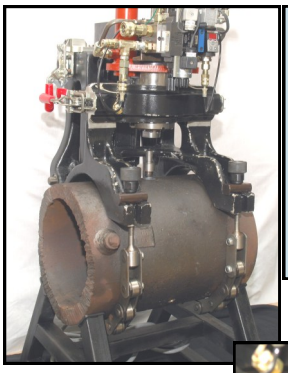
Our academic sibling entity

The Friction Processing Research Institute (FPRI), within the NMMU, is recognised as a leader in the field of friction processing. This institute was established to identify and support the needs of the national and International friction processing community. This is obtained by aspiring to contribute to sustainable development through high quality research, technology development and continuing human resources development.

FPRI's purpose is to engage in research, grow knowledge in the field of friction processing with a focus on process optimisation of innovative friction processing techniques. FPRI serves as the academic link for industrial interaction and research within the field of friction processing. This enables the institute to offers mechanical engineering students first hand access to industry related projects and research and innovation.

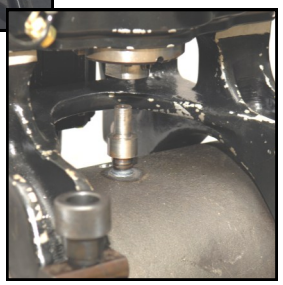
The FPRI team consist out of four members namely: **Prof A. Els-Botes** (Chairperson); **Prof D. G. Hattingh** (Director of eNtsa); **Prof P. McGrath** (Head of Department: Mechanical Engineering) and **Dr H. Lombard** (Senior Lecturer: Mechanical Engineering).

For more information, *visit www.nmmu.ac.za/fpri*.



Caption of top left picture:

Friction Taper Stud welding Machine used for WeldCore™, the **award winning friction processing technique.**



Caption of bottom right picture:

Friction Taper Stud weld performed on a steam pipe sample.

Graduation 2011

This year's Nelson Mandela Metropolitan University graduation ceremonies took place from 08 - 21 April 2011. Four members from walked the stage obtaining various qualification.

***Left*: Mr Donnie Erasmus** graduated with his MTech Engineering: Mechanical degree.

***Right:* Mr Madindwa Mashinini** graduated with his MTech Engineering: Mechanical degree

***Left*: Mr Maien Hamed** graduated with his MEng: Mechatronics degree.

***Right:* Ms Nadine Marupen** graduated with her BTech Public Relations Management degree,

Congratulations to the 2011 graduates.

Voted Hero

News clipping from The Herald, 24 May 2011, p. 14

HERALD, Opinion
24 May 2011, p.14

DANIE HATTINGH

Hero of the day

THE NMMU engineering professor has been spearheading the award-winning WeldCore technology for almost a decade. This will boost the research credibility of the university.

Professor Danie Hattingh, Director of the eNtsa unit, received public recognition for is impact within the field of engineering.

Prof Hattingh who built immense expertise within the engineering sphere, particularly the field of fatigue analysis and friction processing, is the heart and head that steers eNtsa. His is a Professor within the department of Mechanical engineering and a key member of the Friction Processing Research institute.

Over the span of his career Prof Hattingh has been involved with members of the national and international research and industrial community and continues to strive towards improving innovation and technology transfer for the South African engineering community.

"Your ability as a researcher to make a difference in life depends on how rapidly you can embrace new knowledge and technology to develop environmentally responsible and innovative engineering solutions for the manufacturing industry…. Knowledge driven innovation is the key element in providing aggressive top-line growth for increasing bottom-line results responsibly." ***Prof DG Hattingh***

Family Fun

End-Year function

The eNtsa team celebrated their 2010 teambuilding end-year function at the beautiful surroundings of the Sitrusoewer river camp in Kirkwood. The break session was filled with great fun and excitement for both the young and more mature crowd. Teambuilding activities were focused on the Xhosa culture and traditions.

The eNtsa family participated in hut-building, stick-fighting, traditional dances, canoeing, drumming and a hiking along the orchid fields.

To conclude the days fun guest were entertained with traditional singing and dancing. Thereafter everyone feasted on potjie-kos and traditional Xhosa beer. Good company and great fun resulted in an excellent team-building experience.












Inspiration

"Happy are those who dream dreams and are ready to pay the price to make them come true."

- Leon J. Suenes

True success is the result of endurance and honesty. 2011 has presented it's own difficulties, whether professional or personal. Pursue everything you do with a fearless heart and peace of mind. May 2012 be prosperous!

In memorial of Dr Calvin Blignault

NMMU community has been in grief since the tragic loss of Dr Blignault on 21 August 2010. His smile, charm and passion is truly missed. The fond memories of our colleague and friend will always remain with us.

Special word of thanks

Special word of thank you to the eNtsa Board, eNtsa team and the Technology Innovation Agency for their dedication and efforts towards the succession and development of the technology station programme and eNtsa as a contract research group.

Send your stories and photos to Nadine Marupen at

Nadine.Marupen@nmmu.ac.za

For more information on published articles in this issue and to view this Newsletter electronically , visit www.nmmu.ac.za/eNtsa